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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO.                |
|--|-------------|----------------------|-------------------------|---------------------------------|
| 09/881,218   | 06/13/2001  | Ansheng Liu          | 042390P11429            | 7592                            |
| 7590   | 08/22/2005  |                      |                         | EXAMINER<br>PRITCHETT, JOSHUA L |
| James Y. Go<br>BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP<br>Seventh Floor<br>12400 Wilshire Boulevard<br>Los Angeles, CA 90025-1026 |             |                      | ART UNIT<br>2872        | PAPER NUMBER                    |
|  |             |                      | DATE MAILED: 08/22/2005 |                                 |

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                     |              |  |
|------------------------------|---------------------|--------------|--|
| <b>Office Action Summary</b> | Application No.     | Applicant(s) |  |
|                              | 09/881,218          | LIU ET AL.   |  |
|                              | Examiner            | Art Unit     |  |
|                              | Joshua L. Pritchett | 2872         |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 11 July 2005.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1,2,4,7 and 30-43 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 1,2,4,7 and 30-39 is/are allowed.  
 6) Claim(s) 40-43 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 02 April 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

This action is in response to Amendment after non-final rejection filed July 11, 2005.

Claim 40 has been amended as requested by the applicant.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 40-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Chwalck (US 5,418,802).

Regarding claim 40, Chwalck discloses directing an optical beam into a first end of an optical path (4) having the first and second end disposed in a semiconductor substrate (5; Fig. 4B); establishing a Bragg grating (7) within the optical path with a plurality of electrodes (8 and 9) positioned to perturb an effective index of refraction a plurality of times along a direction of propagation (direction of arrow between elements 6b and 26) through the optical path (Fig. 4C); reflecting a first portion of the optical beam having a first center wavelength back out from the first end of the optical path with the Bragg grating and tuning the Bragg grating to reflect a second

portion of the optical beam having a second center wavelength back out from the first end of the optical path (col. 7 lines 31-65; col. 8 line 67 – col. 9 line 19).

Regarding claim 41, Chwalck discloses applying a voltage to the plurality of electrodes to perturb a concentration of free charge carriers a plurality of times along the optical path (col. 7 lines 31-65; col. 8 line 67- col. 9 line 19).

Regarding claim 42, Chwalck discloses modulating charge in the optical path by modulating a voltage applied to the plurality of electrodes (col. 7 lines 31-65; col. 8 line 67- col. 9 line 19).

Regarding claim 43, Chwalck discloses confining the optical beam to remain within the optical path between the first and second ends with an optical waveguide disposed in the semiconductor substrate between the first and second ends (col. 6 lines 47-52).

#### *Response to Arguments*

Applicant's arguments filed July 11, 2005 have been fully considered but they are not persuasive.

On pages 6 and 7 of Amendment, applicant argues that the Chwalck Bragg reflector is fabricated into a wafer and therefore not established by perturbing an index of refraction. The term, "fabricate" and "establish" do not mean the same thing in this context. Merriam-Webster's Collegiate Dictionary tenth edition defines establish as bringing about an effect. Clearly the perturbation of the refractive indices is what brings about the effect of the Bragg reflector; therefore the Chwalck reference meets the current claim limitations.

On page 7 of Amendment, applicant argues that Chwalck teaches away from the use of perturbing the refractive index in a direction of propagation because electrodes (8 and 9) establish “uniform electric fields.” The use of “uniform electric fields” does not prevent the indices of refraction being perturbed along the propagation direction. The use of different materials that respond differently to the “uniform electric fields” would cause the refractive index to be perturbed along the propagation direction. The applicant seems to consider the claim requires that the electrodes be within the optical path. The claim states, “a Bragg grating within the optical path with a plurality of electrodes *positioned* to perturb the effective index of refraction” (emphasis added). The term “positioned” does not require the electrodes to be within the optical path only that the electrodes be in a position to perturb the refractive index. The Chwalck reference shows in Fig. 4C that the electrodes are in a position to perturb the refractive index and therefore meets the claim limitations as currently written.

***Allowable Subject Matter***

Claims 1, 2, 4, 7, 30-39 are allowed.

The following is an examiner’s statement of reasons for allowance:

Regarding claims 1 and 37, the prior art of record fails to teach or suggest directing an optical beam into an optical path and reflecting a first portion of the beam having a first wavelength back out of the optical path, with first and second pluralities of silicon and polysilicon interfaces oriented substantially perpendicular to the semiconductor substrate.

Samara-Rubio (US 6,600,864) teaches a tunable grating with polysilicon (135 and 137) extending into the optical path (103) and oriented substantially perpendicular to the semiconductor substrate (102). Samara-Rubio lacks the claimed silicon and polysilicon interfaces. Samara-Rubio teaches the use of two polysilicon capacitors but the polysilicon only interfaces with the insulators (153 and 155) therefore no interface between the silicon of the optical path and the polysilicon of the capacitors exists.

Regarding claim 30, the prior art of record fails to teach or suggest the use of a plurality of insulated conductor structures protruding into the optical path disposed in a semiconductor substrate and reflecting a first portion of the optical beam back out the first end of the optical path.

The remaining claims depend from claims 1, 30 and 37 and are allowable for the same reasons.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLP



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SUPERVISORY PATENT EXAMINER